

# इंटरनेट

# मानक

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IS 8007 (2004): Road vehicles mechanical coupling between tractors and semi-trailers - Interchangeability [TED 22: Transport Tractors and Trailers]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक  
सड़क वाहन — ट्रैक्टरों और अर्ध-ट्रेलरों के मध्य  
यांत्रिक युग्मक — अतंर्विनिमयता  
( पहला पुनरीक्षण )

*Indian Standard*

ROAD VEHICLES — MECHANICAL COUPLING  
BETWEEN TRACTORS AND SEMI-TRAILERS —  
INTERCHANGEABILITY  
( *First Revision* )

ICS 43.040.70

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**BUREAU OF INDIAN STANDARDS**  
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NEW DELHI 110002

NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical with ISO 1726 : 2000 ‘Road vehicles — Mechanical coupling between tractors and semi-trailers — Interchangeability’ issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of the Transport Tractors, Trailers and Industrial Trucks Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 1976 which was based on ISO 1726 : 1973. Subsequent to the revision in the ISO 1726 : 2000, this standard has been revised to bring it in line with the revised ISO Standard.

The text of ISO Standard has been approved for publication as an Indian Standard without deviations. Certain terminology and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
- b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

CROSS REFERENCE

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated. However, that International Standard cross referred in this adopted ISO Standard, which has subsequently been revised, position in respect of latest ISO Standard has been given:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 337 : 1981 Road vehicles — 50 Semi-trailer fifth wheel coupling pin — Basic and mounting/inter-changeability dimensions	IS 6763 (Part 1) : 1987 Specification and testing for fifth wheel king pin for semi-trailers: Part 1 Size 50	Equivalent

BIS CERTIFICATION MARKING

For BIS certification marking, details are available with the Bureau of Indian Standards.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

**ROAD VEHICLES — MECHANICAL COUPLING  
BETWEEN TRACTORS AND SEMI-TRAILERS —  
INTERCHANGEABILITY**

*( First Revision )*

## **1 Scope**

This International Standard specifies dimensions to ensure interchangeability between a tractor vehicle and a coupled semi-trailer, the two together constituting an articulated vehicle. It specifies certain interchangeability dimensions, including those of the gooseneck contour, as well as operating dimensions related to angle values. The specifications permit the same semi-trailer to be used with either two- or three-axle tractors.

Annex A gives interface technical specifications for tractors designed for towing high-cube semi-trailers, including ISO containers having an external height of 2,9 m.

This International Standard covers articulated vehicles used in commercial cargo transport of the greatest possible variety. However, it may not be applicable to special combination types such as low-bed or tipper vehicles.

This International Standard does not provide limitations of maximum gross mass and overall dimensions, which are generally laid down by legislative requirements.

## **2 Normative reference**

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, this publication do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 337, *Road vehicles — 50 semi-trailer fifth wheel coupling pin — Basic and mounting/interchangeability dimensions.*

### 3 Interchangeability dimensions

#### 3.1 Height of fifth wheel of laden tractor

The height,  $h$ , of the fifth wheel of a laden tractor above the ground reference plane, GRP (see Figure 1), shall be in the range 1 150 mm to 1 300 mm.

#### 3.2 Height of fifth wheel of uncoupled tractor

The height  $h$  above GRP of the fifth wheel of an uncoupled tractor shall not exceed 1 400 mm.

#### 3.3 Forward-clearance-zone radius of semi-trailer

The semi-trailer's forward-clearance-zone radius,  $d$  (see Figure 2), shall not exceed 2 040 mm.

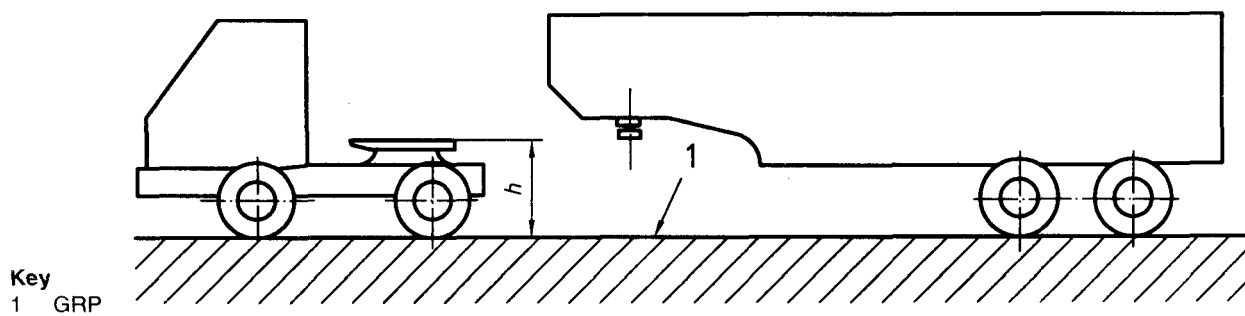
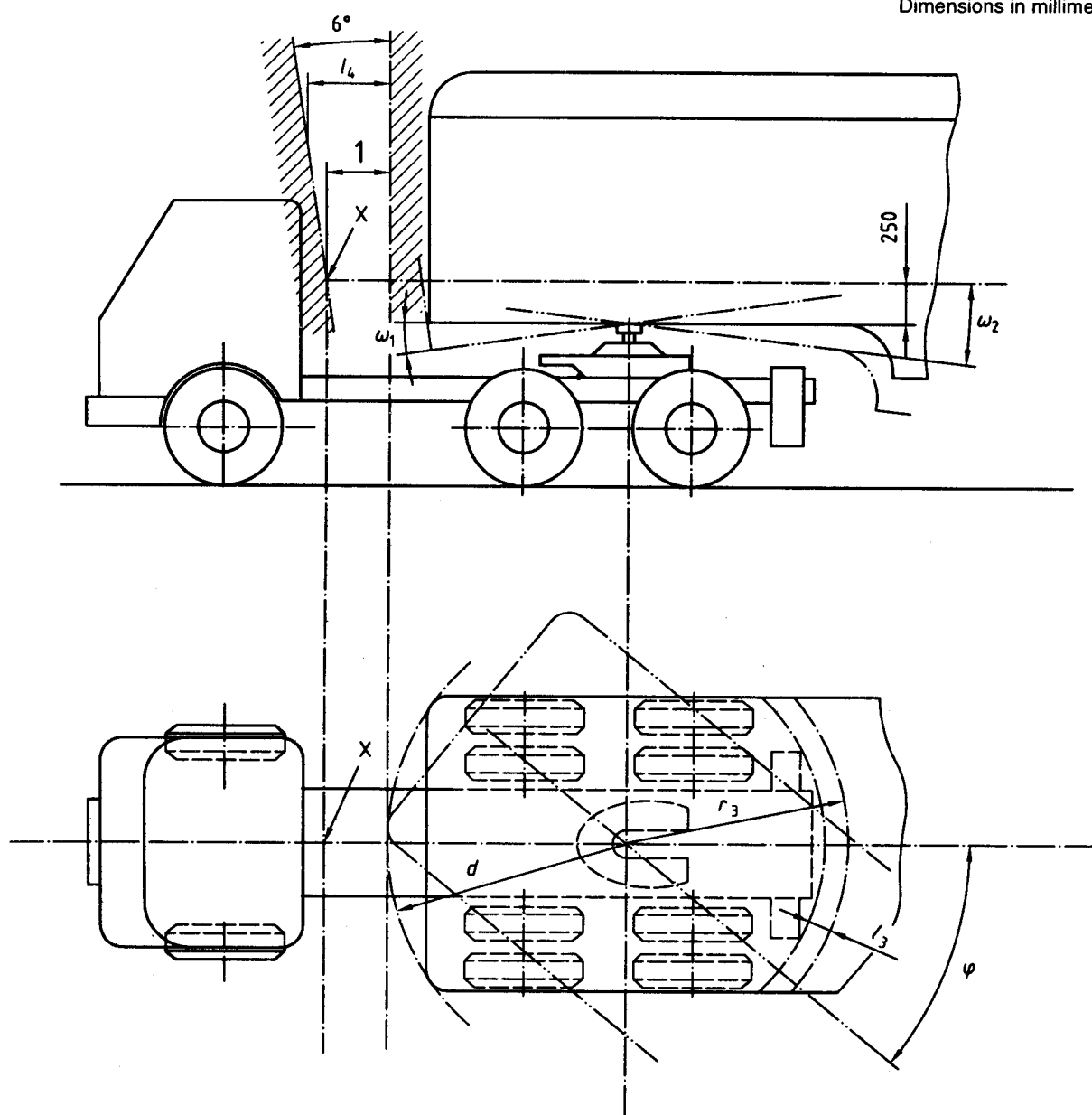


Figure 1 — Height of fifth wheel

Dimensions in millimetres



#### Key

1  $l_4$  at point X = 80 mm min

Figure 2 — Free space between tractor and semi-trailer

### 3.4 Gooseneck contour

The gooseneck shall be located on the outside of a surface consisting of two planes and one surface of revolution interconnected without forming a step. These three parts of the total surface are shown in Figure 3 and defined as follows:

- a plane horizontal and perpendicular to the axis of the coupling pin with a length of  $l_2$  (AB) and a width of that of the semi-trailer, limited by the intersection of
- a second plane of the same width, making an angle  $\gamma$  with the first plane, limited by the intersection of

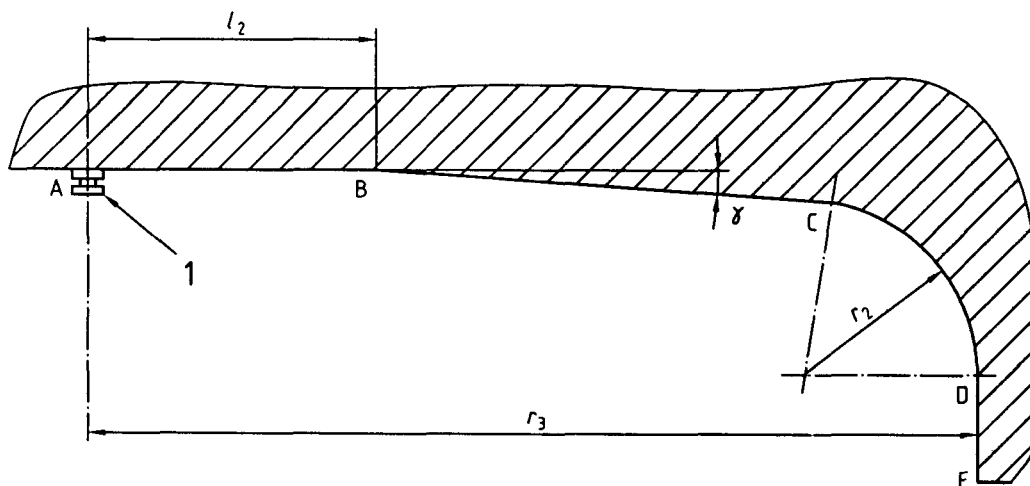


- a surface of revolution generated by rotating the vertical portion DE, situated at a radius,  $r_3$ , from the axis of the coupling pin, and an arc of a circle of radius  $r_2$  (CD – C'D'), between the second plane and DE, such that no discontinuity arises.

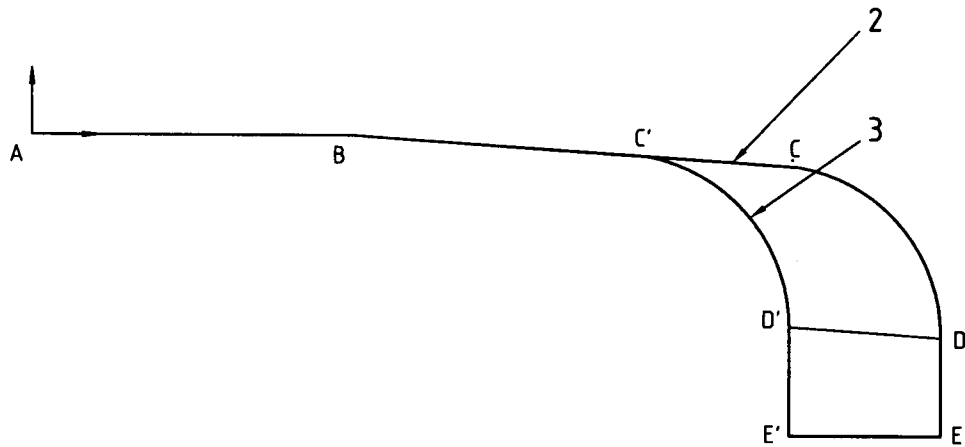
The values adopted for these generator elements:

- $l_2 = 750$  mm
- $\gamma = 4^\circ$
- $r_2 = 450$  mm
- $r_3 = 2300$  mm

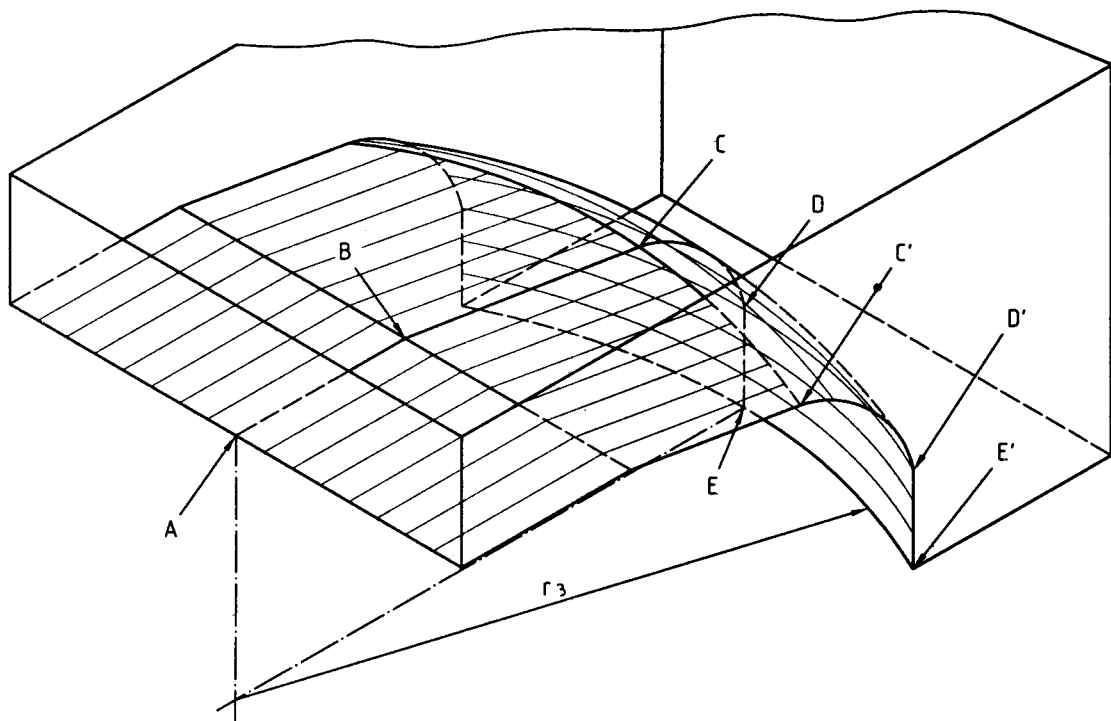
The above dimensions allow the determination of the centre of the circle of radius  $r_2$ .



a) Gooseneck contour: generator elements



b) Gooseneck contour: centre and outer profiles



c) Gooseneck contour: three-dimensional view

**Key**

- 1 Coupling pin (in accordance with ISO 337)
- 2 Centre profile
- 3 Outer profile

**Figure 3 — Gooseneck contour**

## 4 Operating dimensions

### 4.1 Angles of inclination of semi-trailer in relation to tractor

The tractor shall be constructed so that tractor and semi-trailer components, except for those concerned with articulation, do not make contact with each other when the articulated vehicle is running in a straight line, and when the angle of inclination of the semi-trailer relative to the tractor does not exceed the following values (see Figure 2):

- $\omega_1 = 6^\circ$  towards the front;
- $\omega_2 = 7^\circ$  towards the rear.

For the purposes of the measurement of  $\omega_1$  and  $\omega_2$ , the fifth wheel plate is assumed to be situated in a horizontal plane. The tractor shall be set at the attitude which corresponds to the design laden condition when the tractor is standing on a horizontal plane.

### 4.2 Lateral inclination

When the trailer is at a lateral inclination,  $\delta$  (see Figure 4), of a maximum of  $3^\circ$  relative to the tractor chassis, there shall be no contact between the tractor chassis and the semi-trailer.

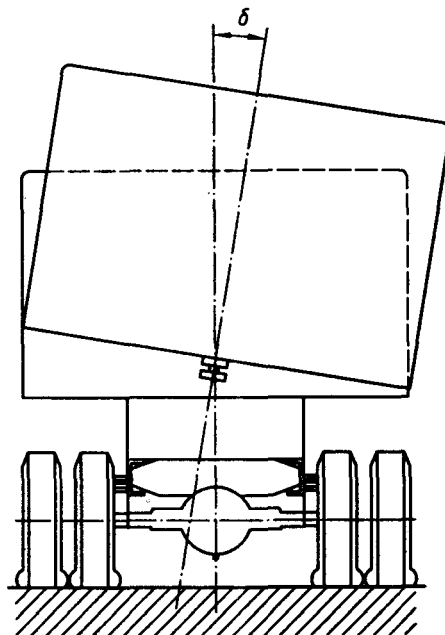


Figure 4 — Lateral inclination

### 4.3 Angle of articulation

The angle of articulation  $\varphi$  (see Figure 2) is the projection of the angle between the longitudinal axes of the tractor and semi-trailer in the horizontal plane.

The articulation of the vehicle shall be such that no contact is made between the semi-trailer and the tyres or spray-suppression equipment of the tractor, taking into account the maximum value  $\omega_2 = 7^\circ$  for all angles  $\varphi$  up to  $25^\circ$ , for both two- and three-axle tractors.

Under manoeuvring conditions, the angle of articulation  $\varphi$  shall be able to reach  $90^\circ$ , with the angle of inclination  $\omega_2$  varying from  $7^\circ$  to  $3^\circ$  as  $\varphi$  varies from  $25^\circ$  to  $90^\circ$ .

#### 4.4 Free space between tractor and semi-trailer

The free space between the tractor and semi-trailer is measured as follows (see Figure 2).

- a)  $l_3$  is the distance between two cylinders of revolution, both having the kingpin axis as their axis. One of these cylinders has the radius  $r_3$  (lower part of the gooseneck); the other cylinder is that of the smallest radius within which all points of the rear part of the tractor are located. The distance  $l_3$  shall be a minimum of 100 mm.
- b)  $l_4$  is the horizontal clearance between a cylinder of revolution having as its axis the axis of the fifth wheel coupling and a conical surface of revolution having the same axis. The cylinder of revolution has the radius  $d$ . The conical surface is generated by a line making an angle of  $6^\circ$  from the vertical towards the front of the tractor. This line is positioned in such a way that the conical surface does not interfere with any point of the tractor located above the fifth-wheel coupling horizontal plane. A point, X, of this surface is positioned on the plane of symmetry of the semi-trailer at a height of 250 mm above the fifth wheel coupling face. At X,  $l_4$  shall be a minimum of 80 mm.

### 5 Designation

Tractors and semi-trailers in compliance with the requirements of this International Standard (excluding annex A) shall be designated:

Tractors and semi-trailers ISO 1726-S

Tractors and semi-trailers in compliance with annex A of this International Standard shall be designated:

Tractors and semi-trailers ISO 1726-A

## **Annex A** (normative)

### **Interface specifications for tractors designed for towing high-cube semi-trailers**

For tractors designed to tow high-cube semi-trailers, including ISO containers having an external height of 2,9 m, the requirements in stead of those stated in 3.1 and 3.2 of this International Standard are:

- the height  $h$  above GRP of the fifth wheel of a laden tractor shall be in the range 1 025 mm to 1 100 mm;
- the height  $h$  above GRP of the fifth wheel of an uncoupled tractor shall not exceed 1 150 mm.

Although three-axle tractors are not excluded from annex A, it might be difficult to apply its specifications and at the same time comply with the angles of inclination and other requirements specified elsewhere in this International Standard. Any deviations from compliance should be carefully evaluated by those competent to do so in order to decide whether safe and satisfactory operation can be ensured.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. TED 22 (440).

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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